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Impact of Online Training Program on Health-Related Physical Fitness among Young Adults

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Abstract: *Since the onset of the pandemic and its subsequent demise, many have jumped onto online platforms as a means of working, shopping, learning, and conducting training program. This study was designed to determine the impact of online training program on health-related physical fitness. The results of the study indicate that online training program showed significant improvements in most of the parameters studied, which include Vo2 max, plank test, sit and reach exercise, and hand grip strength significantly meaning that indeed online training program if conducted properly can be impactful on health related-physical fitness. Even BMI and skin fold measurement showed improvement of the participants after the conclusion of the study also fund significant. Thus, it can be concluded that online training program holds great potential in improving health related physical fitness and should be compared in future studies with the traditional training program methods.*

Key Words: Health, Training Program, Exercise

Introduction

Physical activity is considered to be an essential factor for reducing morbidity and mortality in individuals. If a person is physically active and moves away from a sedentary lifestyle they will have a better quality of life than those who are not seeking a physically active lifestyle. If one conducts physical activity at a high-levels regularly then there is also a greater chance of reduction in the risks of cognitive impairment, and studies have confirmed that physical activity has been implied to have a protective effect against the dreaded decline of cognitive function and dementia (Bangsbo J, 2019; Laurin D, 2001). Furthermore, overweight and obesity have reached high levels due to an increase in sedentary lifestyle, leading to an increased risk for cardiovascular diseases, hypertension, dyslipidemia, and diabetes mellitus (Lavie CJ, 2018; Elagizi A, 2018). Moreover, since the onset of the covid-19 pandemic which was a global health crisis of epic proportions activities had declined further and the sedentary lifestyle increased (Bavel JJ, 2020; Bentlage E, 2020). Imposing lockdowns to flatten the curve and reduce the spread of the illness caused a radical change in the lifestyle of people that are affected which also included physical activities and exercises (Jimenez-Pavon D, 2020; Ammar A, 2020). The COVID-19 pandemic and its subsequent lockdown led to decline in all forms of activity that required energy and participation, moreover a rise of twenty eight percent in regular sedentary lifestyle and a ill-mannered habit of diet and nutrition (Ammar A, 2021). Furthermore, it has also led to a deficit in postural sway leading to debilitating and deadly falls (Karmali F, 2021). Postural sway is commonly used as a tool to assess the ability of individuals to balance the body while standing upright. Postural sway can evaluate injury risk in athletes, falling assessment in adults, and

neuromuscular and sensory assessment (Ambrose AF, 2013; Faffegeau TE, 2019 & Kurz I, 2013). To overcome this, physical training must be carried out, unfortunately, due to the pandemic there has been a reducing in in-person training and people are reluctant to travel to seek physical training. Hence, online training programs are being conducted and using internet-based physical activity can solve a lot of problems (Joseph RP, 2014). This is only due to the rapid advancement in technology which is finally now providing instructor to provide information using the internet in the form of video, audio, and text, rather than the traditional weight training class where many students come at the gym and the instructor trains them accordingly (McNamara JM, 2008). If there is a well-designed online training program then health related physical fitness can be improved significantly (Klusemann MJ, 2012). However, online physical education is a fruitful offering, it also presents its unique set of challenges (Goad T, 2017). Unfortunately, there is limited data available for these investigations to find a definitive solution. The main thing now that must be answered is the impact that online physical programs have on the overall health and fitness of individuals. We already have available data for the impact of a physical training program on health-related physical fitness (Carson KV, 2011; Bulckaen M, 2022; Hammami A, 2022; Myers J, 2019 & Franklin BA, 2020). However, the same cannot be said for the online training program. Thus, an experimental study conducted to evaluate the impact that an online training program on health-related physical fitness.

Methodology

An experimental study was conducted which spanned for a duration of 6 months after seeking ethical approval from the IRB of the institute. The sample size for the study was 30 and consisted of young adults between the age of 18-25 years. The sample for the study was acquired through a non-probability convenience sampling technique. All the participants that were chosen in the study were all healthy, and any participants that had an illness were omitted. The physical activity readiness questionnaire (PAR-Q) form was chosen to be adapted as a screening tool for fitness before the online training program could be initiated. The participants were all placed in one group who were tasked to perform online training program. Data collection was performed in the following manner:

Before the commencement of training, initially, everyone was asked to warm up for a period of ten minutes, and then were given the same amount of time to easily cool down. Each exercise that was to be performed by the participants was carried out for 30 seconds, and once the exercise was done they were given a rest time of 20 seconds. After the end of the particular exercise, a 3-minute rest was given between sets. In total total training was conducted for one hour which does include the warm up time and cool-down time and this was repeated for 12 weeks. (Kim JW, 2018)

Table 1

Sr. No	Activities	Performances		Level of intensity	Duration
1	Warm-up	Dynamic stretching		40%–50% HR max	10 min
2	Complete training	Resistance based exercise	Push-up, squat, crunches, lunge, and superman exercise	In weeks 1–8, 50%–60% HR max	40 min
		Exercise (Aerobic)	Foot stomps, steps, jumping jacks, running on the spot, and light jumping	In weeks 9–12, 60%– 70% HR max	
3	Cool-down	Static stretching		40%–50% HRmax	10 min

For the study, we measured the body mass index, skinfold measurements, VO2 max testing, push-up test, sit-and-reach testing, handgrip strength test, and lastly the plank test. The data that was obtained in the study was then analyzed SPSS Version 25.0. This descriptive data that was used for represented in the form of frequency and percentage tables, and paired t-test was also used. P<0.05 was the significant value.

Results

Table 1: Shows the mean age of participants, which was 22.4 and S.D was 2.242.

Table 2: Shows gender of the participants in the study in the form of frequency and percentage.

Table 3: Shows the mean pre and post score of body mass index (BMI). The significant difference is seen between the pre and post training value with a p-value of 0.0341.

Table 4: Shows pre and post-mean score of skin fold measurement. A significant difference is seen in between the pre and post training value with a p-value
0.011.

Table 5: Shows pre and post mean score of VO2 Max before and after the training program. The significant difference is seen in the VO2 max with a p-value of 0.001.

Table 6: Shows mean pre and post value of push up test before and after the training program. The significant difference is seen in the push up test value with a p-value of <0.000.

Table 7: Shows mean pre and post value of sit and reach test before and after the training program. The significant difference is seen in the pre and post value of sit and reach test with a p-value of <0.000.

Table 8: Shows pre and post-value of handgrip strength combine score of left and right handers before and after the training program. The significant difference is seen with a p-value of 0.011.

Table 9: Shows pre and post value of plank score test before and after the training program. The significant difference is seen with a p-value of <0.000.

Table 2. Mean age of participants

	N	Minimum	Maximum	Mean	Std. Deviation
Age in years	90	18	25	22.4	2.242
Valid N (listwise)	90				

Table 3. Gender of the participants in the study in the form of frequency and percentage

	Male	Female
Group A	20 (66.67%)	10 (33.33%)

Table 4. Mean pre and post score of body mass index (BMI).

	Mean (SD) kg/m		
	Pre-Training	Post Training	p-value
Group A	25.12 (3.64)	24.85 (3.20)	0.0341

Table 5. Pre and post a mean score of skin fold measurement

	Mean (SD) mm		
	Pre	Post	P-value
Group A	21.3 (8.3)	20.91 (9.45)	0.011

Table 6. Pre and post a mean score of VO2 Max before and after the training program

	Mean (SD) ml/kg/min		
	Pre-Training	Post Training	P-value
Group A	41.5 (5.21)	49.6 (7.62)	0.001

Table 7. Mean pre and post value of push up test before and after the training program

	Mean (SD)		
	Pre-Training	Post Training	P-value
Group A	11.75 (6.5)	25 (7.12)	0.000

Table 8. Mean pre and post value of sit and reach test before and the conclusion of the training program

	Mean (SD) cm		
	Pre	Post	P-value
Group A	14.10 (4.66)	21.78 (5.21)	0.000

Table 9. Mean pre and post value of handgrip strength test combine score of the left and right hand before and after the training program

	Mean (SD) Kg		
	Pre training	Post training	P-value
Group A	80.45 (9.68)	88.29 (7.69)	0.011

Table 10. Mean pre and post value of plank score test before and after the training program

	Mean (SD)		
	Pre training	Post training	P-value
Group A	19.07 (11.23)	40.85 (9.19)	0.000

Discussion

The motivation behind this study was to decide if online physical training can be considered an effective and impactful method of achieving physical fitness or not. Physical fitness allows people to carry out all their daily activities with efficiency; however, physical fitness varies from individual to individual and it help to reduce the onset of severe comorbidities including stroke (Saunders DH, 2020). The study shows that indeed online physical fitness improves a lot of parameters which include VO2 max, push-up test, sit and reach exercise, handgrip strength test, and plank test. Similar findings can be seen in another study that suggests in adolescents there can be an improvement in the level of fitness to a great degree using if the proper form of physical education can be delivered online in class methods, further showing that mass of muscle, the strength of the ankle, the strength of the hip, , knee strength, and balance all improved using the synchronous online

physical education classes (Lee KJ, 2021). Data shows that if done right, and if proper strategies are developed in promoting online training then there will be an improvement in physical activity and motivation in those participating in online physical training (Dana A, 2021). Some fail to disagree that physical education or training that is delivered using online means is still not optimal as of now (Dana A 2021). The reason behind this is that both the instructors and the participants that are involved in the program are still unable to adapt to this new method, as it just became prominent now during the covid-19 pandemic and for the past centuries only physical and in-person method has been implemented at large. Online physical training requires special preparation to be conducted, furthermore, it needs a strong operation to communicate everything coherently to the ones attending the session (Jeong HC, 2020). Future studies can be carried out to see if online training is actually conveying all the methods of physical training in an effective manner or not as most of the studies available are fairly limited (LM HJ, 2007; Lyu, 2011 & Hong SH, 2006). There are studies available that have suggested this and other which have proposed new ideas of the teaching of physical training in a blended manner. In online physical training studies, there might be a lack of motivation missing or supervision of the instructor can be considered to be fairly limited, this can be confirmed in the future if online physical training and physical training both are compared to one another in greater depth. Kocher et al has found that fitness levels don't increase drastically in online physical training as compared to the traditional methodologies of training (Brown PL, 2003). On the contrary, brewer et al found that both the level of knowledge, as well as the level of fitness, did significantly rose in online physical training (Brewer JD, 2001). So ultimately, it is still not clear and is up for debate that is online physical training as effective as the traditional method of training. This can only be solved once more and more data comes into action. Both what we can ultimately say is that physical fitness and physical training is prudent to achieve a healthy and active lifestyle. The importance of physical fitness and regularly exercised is acknowledged for thousands of years with literature becoming filled with vast amounts of evidence stating that physical activity indeed has a major role in reducing chronic obesity, heart and vascular diseases, blood pressure, diabetes mellitus type II, metabolic syndromes, hyperlipidaemia, and lastly cancers of the breast and colon along with alleviation depression and anxiety (Berryman JW, 2010; Blair SN, 2009; Galper DI, 2006; Goetzel RZ, 2012; Kohi, 2012; Pratt M, 2014; Wen CP, 2012 & Silverman MN, 2014). Indeed, online physical training provided a major impact on the parameters that were targeted in our study but in future studied it can focus on other parameters and can be compared to the traditional physical training program with a larger sample size.

Conclusion

The online training program is an impactful way of carrying out physically activity and achieving physical health and can be broadened further in scale to other parts of the country to delivering effective online training programs. The parameters studied in the current study showed significant differences using the online training program thus indicating its effectiveness and its potential is still untapped and can be utilized in the future in full.

Suggestions

Online training is also cheaper and cost-effective and can be utilized by anyone who just has a basic internet connection in areas that are inaccessible especially rural areas where there is difficulty in finding trainers to carry out physical training, online training can be used as an alternative. The study only targeted young adults, future studies can be tailored made to target out age groups such as children, teenagers, and older adults as well. Moreover, other parameters can also be studied in future studies as well.

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